2017

Encyclopedia of Astrobiology [book review]

Kevin McDonough
Northern Michigan University, kmcdonou@nmu.edu

Astrobiology seeks to study the origin, evolution, and distribution of life in the universe, and is a multi-disciplinary field encompassing geology, chemistry, physics, astronomy, biology, engineering, and computer science. As a relatively new discipline astrobiology gained prominence in the 1950s when NASA funded its first astrobiology project. The discipline has since grown through the expansion of space exploration, and fueled by the discovery of microbes living on earth in extreme environments, such as in hydrothermal vents in the deep ocean or the ice of Antarctica.

Debuting in 2011 to critical acclaim the *Encyclopedia of Astrobiology* is now in its second edition and includes 300 additional entries. The discovery of 1,200 new planets and orbiting stars; further exploration of the conditions necessary for life on Mars, Saturn's satellites, and comets; knowledge of increasingly complex organic molecules in interstellar space; and recent space missions and telescopes have brought about significant discoveries.

The *Encyclopedia of Astrobiology* under review is the electronic version available from Springer. Entries are arranged alphabetically, although additional access is provided through an "Astrobiology by Discipline" feature at the beginning of the book. In the discipline grouping approach there are overarching categories, followed by subsections that list individual terms found within the encyclopedia. As an example, the category Astrophysics and Astrochemistry is further subdivided into the sections astrochemistry, astrophysics, nucleosynthesis, and stars. This categorization helps narrow the focus for readers who are interested in particular disciplines of astrobiology.

Each encyclopedia entry varies in length from short definitions of two to three sentences to multiple pages. The start of each entry lists the author responsible for the content, followed by some keywords and/or synonyms for the term. The synonyms are linked to other entries in the encyclopedia, but the keywords stand alone, making the importance of keywords unclear. Keywords may serve to increase relevancy when searching. More confusing is the why some entries have keywords/synonyms while others do not.

All entries conclude with a list of references or sources for further reading. Unfortunately, the use of references within the text is variable. Some authors cite other authors within the text of entries, while others include a list of references at the end. In the latter case it is hard to know if the authors drew upon the cited authors in creating the entries or are only providing a further reading list. Unlike many encyclopedias which overemphasize text, the *Encyclopedia of Astrobiology* has a good number of visual aids included. These can range from chemical equations to colored and black & white figures, pictures, tables, and graphs. Overall, the balance of text to images emphasizes text, but the variety and number of visual aids is quite good and better than many subject encyclopedias.

As mentioned earlier, the *Encyclopedia of Astrobiology* is an electronic source hosted through Springer Link, Springer's online platform. The problem with many electronic platforms is the soul of the book is lost. Instead of being able to peruse the book, taking in the images and

entries as a whole, you are forced to browse an alphabetical listing of terms (with only 20 displayed at a time) or rely on searching. The encyclopedia loses its feel as a familiar and nostalgic tool, and simply becomes an amorphous collection of facts and figures.

That said, electronic encyclopedias offer increased functionality. Synonymous terms, "see also" references, and cited references within entries all provide direct links to content. However, this linking often falls short. Terms linked through a digital object identifier (DOI) fail to connect at times and return errors. Cited references take you to the top of the page containing the references, not to a specific reference. Clicking on a term from the A-Z list of terms provides quick access to an HTML version of the entry. However, if you want to download an entry as a PDF, as in the case of *activity, magnetic*, you retrieve the entire PDF file for all of the "A" entries and are taken to the start of entries, not to the specific term. Browsing entries is hampered by a lack of an alphabetical quick jump. One has start on at the A's and move page by page through the entries. Although there is a search box on every page, it searches all of Springer's content not just the *Encyclopedia of Astrobiology.* To get a "search within this work" option you have to be on the landing page of the encyclopedia. Clearly the encyclopedia was adapted to Springer's online platform that encompasses a variety of sources, rather than designed around reference books in particular. In short, I felt underwhelmed and disappointed this wonderful encyclopedia was not significantly improved upon when converted to an electronic edition.

Criticisms of the online platform aside, the *Encyclopedia of Astrobiology* is an incredible scholarly achievement. At a cost of $1,750 for either a print copy or electronic access, this source is priced primarily for academic libraries with a specialty in this area. Yet, for these libraries this is a "must have" source.